

**AUDIO INTERACTIVE SEXUAL VIBRATOR**

CROSS REFERENCE TO RELATED APPLICATIONS

This application is filed as a Continuation in Part of application serial no. 09/726,660 filed on November 30, 2000.

FIELD OF THE INVENTION

The present invention relates to hand held and battery operated vibrators with the intended usage being sexual pleasure.

DESCRIPTION OF RELATED ART

Throughout the years various types of vibrators and mechanical stimulation devices have been designed and produced from the type with multiple attachments including heat and blowing air as in U.S. Pat. No. 4,722,326. These devices all contain a rudimentary control mechanism that will allow the user to activate or de-activate activate the unit, some will allow variation in speed to suit the user. That is the extent of the interaction between user and device. One device U.S. Pat. No. 5,928,170 allows interaction of a different nature by allowing the user to speak into an on board recorder and play back the sounds during or following sexplay.

An interactive device should not be solely controlled by one source of input. The device should have some built in intelligence so the experience can be enhanced by giving the user unexpected changes in intensity.

Just as a constant noise eventually fades into the background to become unnoticed, so does continual stimulation of a fixed frequency and intensity. The feature of responding to the environment heightens the experience and allows for a more satisfied user.

1    SUMMARY OF THE INVENTION

2           In carrying out principles of the present invention in accordance with a preferred  
3   embodiment thereof, an electrical vibration or oscillating device used for sexual  
4   stimulation or therapy is equipped with a signal processing unit that reacts in response to  
5   signal input, be that signal acoustic, digital, or analog control. The subject invention  
6   further comprises a processor that will respond to software control. The invention will  
7   accept any audio signal, including but not limited to a microphone, CD player, tape  
8   player, video game, or television. Each of the units may be integrated into the device for  
9   convenience or may be attached by a cable or other means to an external box. Typically  
10   the device will respond to audio input signal and stimulate the user by differing types of  
11   vibratory motion, which may be vibratory, oscillatory, thrusting, massaging, rocking, or  
12   tactile motion, accordingly by the frequency and level of the audio input. Low  
13   frequencies will generally cause more vibration high frequencies due to the total energy  
14   contribution for the SPL (sound pressure level) measurement by the lower frequencies.  
15   Also, interaction with computer/console games is achieved through writing of special  
16   software that will generate codes for the activation and control of the vibratory effect.  
17   Interaction with other users at remote locations via the internet, modem, wireless  
18   telephones, pagers, or PDA's with software applications is also a method of control of the  
19   vibratory effect.

20   BRIEF DESCRIPTION OF THE DRAWINGS

21   Figure 1 shows the integrated controller and vibrator.  
22   Figure 2 illustrates the housing for the vibrating mechanism.  
23   Figure 3 is a block diagram illustrating the control circuitry processor.

1 Figure 4 is a block diagram illustrating the effects of an audio signal input on the  
2 vibratory motor.

### 3 DETAILED DESCRIPTION OF THE INVENTION

4 The present invention includes an integrated controller and vibrator, generally  
5 referenced 30, as shown in Figure 1, including a controller 31 that may be attached by a  
6 cable connection 5, as shown in Figure 1, or by a wireless interface 28 as illustrated in  
7 Figure 4. The invention will be comprised of the following--outer housing 12a made of  
8 but not limited to the following materials, plastic, wood, metal, with plastic being the  
9 preferred materials, audio processing unit printed circuit board 10, which may be  
10 integrated with the unit for compactness of or external to the unit in a separate enclosure  
11 connected by a cable 5 or wireless interface 28, on/off switch of button 8, variable tactile  
12 adjustments 8, 9 to adjust the tactile and audio sensitivity of the processor 11 to the input  
13 signal 19, and a bypass switch or button 8 which when engaged will cause the vibrator to  
14 behave in a `normal` operation thus not requiring any external input signal, i.e. performs  
15 like a normal sexual vibrator, and a cover 12b.

16 Table 1 shows a listing of the elements shown in the figures and their corresponding  
17 indicia.

18 Table 1.

19

1	MOTOR
2	HOUSING
3	BATTERY
4	CAP
5	CABLE
6	OUTPUT
7	INPUT/LINKING
8	ADJUSTMENT KNOB
9	ADJUSTMENT KNOB
10	CIRCUIT
11	PROCESSOR
12A, 12B	HOUSING HALVES
13	MICROPHONE

14	BATTERY
15	WIRELESS INTERFACE TRANSMITTER
16	WIRELESS INTERFACE RECEIVER
17	MICROPHONE INPUT
18	SPL MEASUREMENT
19	SENSITIVITY ADJUSTMENT
20	COMPARATOR/TRIGGER CIRCUIT
21	NORMAL SPEED ADJUST
22	DIGITAL CONTROL CIRCUIT
23	MOTOR DRIVE CIRCUIT
24	MOTOR
25	COMPUTER/GAME CONSOLE
26	DECODER MICROCONTROLLER
27	MOTOR POWER SOURCE
28	WIRELESS INTERFACE
30	INTEGRATED CONTROLLER AND VIBRATOR
31	CONTROLLER

1

2

3 The housing 12a of the invention which may or may not be attached by a cable 5 will be  
4 made from a material that is suitable for skin contact, usually but not limited to a phallic  
5 shape similar to a human penis to stimulate sexual intercourse. The housing 12a may also  
6 be of a smaller type housing just having a vibrating mechanism 2 such as the type shown  
7 in FIG. 2 which may be worn for comfort and ease of operation, but for the most part  
8 such vibrators are in the shape of a human penis. Generally such devices are made from  
9 latex plastic or silicone gel which are pleasing to the touch and for insertion into the body  
10 and being round and tapered for easy facilitation into the body orifice or movement on  
11 the skin. The housing 12a is typically hollow for holding power circuitry 3 generally  
12 being portable batteries, but may be other power sources and the audio processing unit  
13 10, but may be solid with power circuitry and audio processing unit external to the unit in  
14 a separate enclosure attached by a cable 5 as referenced by FIG. 1 in the preferred  
15 embodiment arrangement. The vibrating mechanism 2 may be a housing that may be  
16 merely placed against the male or female genitalia or other sensitive portion of the body

1 and provide stimulation by proximity to the skin. The motion exhibited by the device  
2 may be vibratory, but the motion is not limited to vibration. In providing other types of  
3 motion the housing may take on various shapes, the stimulation motion may be granted  
4 by the following types of motion being, but not limited to vibratory, rotational, rubbing  
5 and oscillatory.

6 The invention will contain a processor 11 that will consist of control circuitry that  
7 will sense the frequency, amplitude of the input and send a corresponding pulse to the  
8 vibrating mechanism. See FIG. 3 for a block diagram describing the control circuitry.

9 The invention will contain a sound bypass circuit which will allow for listening to  
10 the audio input with headphones or to another source that will accept input i.e. a  
11 computer, guitar amplifier, or home stereo. The preferred embodiment will have this  
12 circuit located in the side of the unit; this will allow the user to have interaction with both  
13 aural and tactile sensations at the same time, creating a multisensory product. This circuit  
14 may be incorporated into a single device, such as an audio jack 7, but the preferred  
15 embodiment will be a dedicated electrical circuit 10. The invention will utilize a cover  
16 12b to retain the battery(s) 14. The invention may also contain a software interactive  
17 processor 11 which consists of control circuitry which accepts codes written in  
18 computer/console games or applications to activate the vibratory effect. The device may  
19 also contain a circuit whereby the vibratory effect may be controlled by remote control.  
20 The remote control may be operated by utilizing on rf (radio frequency) or ir (infrared)  
21 transmission method.

22 It is an object of the invention to enhance pleasure during sexual intercourse,  
23 sexual stimulation, message, and marital therapy by providing a vibrator that can react to

1 various audio input, whether it be from a CD player, computer game, record player, tape  
2 player or the like.

3 It is another object of the invention is to provide a device, which can provide  
4 comic relief by reducing anxiety during sexual intercourse.

#### 5 Modes of Operation

6 There are three distinct modes of operation of the device; Audio Interactive,  
7 Computer Interactive and Normal Operation.

8 Audio Interactive see Block Diagram in FIG. 4.

9 When an audio signal is applied to the input 17 sound pressure level is measured.  
10 The extracted signal is then amplified with an adjustment for sensitivity. Sensitivity  
11 adjustment, while not required, would be preferred so that the unit might be adjustable to  
12 suit an individual's tastes. This signal is then compared to a reference 20 and while the  
13 reference is exceeded a signal is sent to the drive circuitry 23. This in turn activates the  
14 vibratory motor for a varying duration, thus causing an effect of vibrations corresponding  
15 to the beat/rhythm of the music of audio input signal.

#### 16 Computer Interactive

17 A connection to a computer or gaming console is made 25. Interactive software  
18 titles are writted so that communication through a port such as but not limited to a  
19 parallel port, serial port, USB, game port, or Firewire port is accomplished. With this  
20 done a micro controller or like device is programmed to decode the information sent from  
21 the computer or gaming console 25. This in turn sends a signal of varying duration to the  
22 trigger 20 to provide activation and the control of the vibratory motor as described above.

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1 Normal Mode

2 A `normal` mode is provided with digital level control so that in the event an  
3 audio source or computer/videogame is unavailable, the unit will still function as a  
4 vibratory device with level control feature. By manipulating the normal level adjust, the  
5 vibratory motor engages as stated above and will increase or decrease speed  
6 corresponding to the position of the adjustment which is sensed and converted to a digital  
7 signal by the pwm (pulse width modulation) circuitry in the digital controller 22 and is  
8 sent to the trigger 20. The pwm circuit uses a DC power supply voltage is much greater  
9 than the rated DC voltage of the vibratory motor. The frequency and duty cycle are  
10 adjusted to meet two criteria. First the current flowing through the motor is  
11 discontinuous. And second, that the average current does not exceed the maximum  
12 continuous rating for the motor. This allows the torque of the motor to be at its  
13 maximum level for all speeds. The efficiency increase will reduce the controller  
14 temperature and increase battery life as compared to the current state of the art rheostat  
15 controlled devices. State of the art PWM circuits are designed with high frequencies filter  
16 inductors and capacitors on the output to achieve a 'non pulsed' DC level at the output  
17 which makes for a very good for voltage regulator. The application here uses much  
18 lower frequencies and no output inductor, other than the motor windings, or capacitor,  
19 other than a high frequency filter capacitor to filter unwanted r.f. (radio frequency) noise  
20 generated by the motor.

21 The invention has been described in it's presently contemplated best mode, and it  
22 is clear that it is susceptible to numerous modifications, modes and embodiments within

- 1 the ability of those skilled in the art and without the exercise of inventive faculty.
- 2 Accordingly, the scope of this invention is defined by the scope of the following claims.